

## CLAIMS

What is claimed is:

- 1 1. A mode scrambler, comprising:  
2 an optical fiber adapter having a gap, a first end, and a second end,  
3 wherein a single mode optical fiber is coupled to the first end and a multimode optical  
4 fiber is coupled to the second end; and  
5 a diffuser disposed in the gap.
- 1 2. The mode scrambler of claim 1 wherein the diffuser comprises a piece of  
2 Scotch<sup>®</sup> tape.
- 1 3. The mode scrambler of claim 1 wherein the diffuser comprises a thin piece of  
2 glass.
- 1 4. The mode scrambler of claim 1 wherein the diffuser comprises a thin piece of  
2 plastic.
- 1 5. The mode scrambler of claim 1 wherein the diffuser comprises a thin piece of  
2 acetate.
- 1 6 The mode scrambler of claim 1 wherein the diffuser comprises a thin piece of  
2 acrylic.
- 1 7 The mode scrambler of claim 1 wherein the diffuser comprises particulate  
2 suspended in a material having a uniform index of refraction.
- 1 8. The mode scrambler of claim 1 wherein the diffuser comprises air.

- 1    9.     A method to scramble an optical signal, comprising:  
2                disposing a diffuser between mating ends of an optical fiber adapter  
3    having a single mode end and a multimode end;  
4                launching a single mode signal in the single mode end; and  
5                receiving a multimode optical signal in the multimode end.
- 1    10.    The method of claim 9, further comprising disposing a piece of Scotch<sup>®</sup> tape  
2    between the mating ends of the optical fiber adapter.
- 1    11.    The method of claim 9, further comprising disposing a thin piece of glass  
2    between mating ends of the optical fiber adapter.
- 1    12.    The method of claim 9, further comprising disposing a thin piece of plastic  
2    between mating ends of the optical fiber adapter.
- 1    13.    The method of claim 9, further comprising disposing a thin piece of acetate  
2    between mating ends of the optical fiber adapter.
- 1    14.    The method of claim 9, further comprising disposing a thin piece of acrylic  
2    between mating ends of the optical fiber adapter.
- 1    15.    The method of claim 9, further comprising disposing particulate suspended in a  
2    material having a uniform index of refraction between mating ends of the optical fiber  
3    adapter.
- 1    16.    The method of claim 9, further comprising disposing air in the gap.